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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,799

02/06/2006

Torsten Pechstein

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BACON & THOMAS, PLLC

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EXAMINER

KWAK, DEAN P

ART UNIT

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1797

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,799	<b>Applicant(s)</b> PECHSTEIN ET AL.	
	<b>Examiner</b> DEAN KWAK	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 1-7, 9 and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8 and 11-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the **abstract not exceed 150 words** in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 8 & 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Najafi et al. (US. 6,140,144).

Regarding Claim 8, Najafi et al. discloses a sensor arrangement (e.g., sensor package, Abstract), comprising:

- a semiconductor chip having a first surface (e.g., sensor chip, C6/L34, Fig. 1A (1)), which has a media-sensitive region (e.g., sensing element, C6/L35, Fig. 1A (4)) and

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- at least one, first, electrical contact surface (Fig. 1A (10));
- a support having a second surface (e.g., substrate, C6/L27, Fig. 1A (2)), which faces said first surface of said semiconductor chip (see Fig. 1A),
- has an opening (e.g., access hole, C6/L36, Fig. 1A (3)), which at least overlaps with said media-sensitive region, and
- at least one, second, electrical contact surface (e.g., metal pad, C6/L25, Fig. 1A (7)), which at least overlaps with said at least one, first, electrical contact surface; and
- a sealing element (e.g., conductive polymers & underfill material, C6/L38 & C6/L46, respectively, Fig. 2A (5) & (14), also see Fig. 2C & C7/L3-10), which is *arranged* between said support and said semiconductor chip and produces an electrically conducting connection between said at least one, first, contact surface and said at least one, second, contact surface, and which has a traversing opening, which at least overlaps with the opening in said second surface, so that said media-sensitive region of said semiconductor opening is contactable through said opening (see Fig. 2A (3)) with an analyte, wherein:
  - said sealing element is elastic (e.g., conductive polymers & underfill material, C6/L38 & C6/L46-51, respectively) and seals the region outside of said opening against contamination with the analyte (see Fig. 2C & C4/L49-61); and
  - said elastic sealing element comprises an elastic, insulating, organic layer with a plurality of embedded, conductive particles, grains **or** filaments (e.g., conductive polymers & underfill material, C6/L38 & C6/L46-51, respectively).

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Regarding limitations recited in Claim 8 which are directed to specific properties of a sealing element recited in said claim, it is noted that once the element is disclosed to comprise a material selected from the materials noted in the reference (C6/L38-40 & L46-51), it will, inherently, display recited properties. See MPEP § 2112.

In addition, regarding limitations recited in Claim 8 which are directed to a manner of operating disclosed apparatus (e.g. “clamped between said support and said semiconductor chip”, “contactable through said opening with an analyte”, “seals the region outside of said opening against contamination with the analyte”), it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

Regarding Claim 12, Najafi et al. discloses all of the claim limitations as set forth above. It is noted that the limitations recited in Claim 12 which are directed to a manner of operating disclosed apparatus (e.g. “such that the number of electrical contacts between the grains is insufficient to produce a continuous electrical conductivity”, “by clamping of said elastic insulating organic layer as a sealing element between said support and said semiconductor chip”), it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus

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claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 11, 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Najafi et al. (US. 6,140,144) as applied to claim 8 above, and further in view of Baxter et al. (US. 5,414,284).

Regarding Claim 11, Najafi et al. discloses all the claim limitations as set forth above. In addition, Najafi et al. discloses a conductive polymers & underfill material (C6/L38 & C6/L46, respectively, Fig. 2A (5) & (14); also see Fig. 2C & C7/L3-10). However, Najafi et al. fails to disclose the material being a silicone layer with embedded gold filaments.

Baxter et al. discloses a silicon substrate with gold filament deposited (C2/L61-63).

Najafi et al. and Baxter et al. are analogous because these references are directed to microsensors.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to deposit gold film deposited on a silicon substrate, as taught by Baxter et al., to the sensor arrangement with conductive polymers & underfill material, as taught by Najafi et al., since gold has been known in the art to have high conductivity and are readily available. In addition, silicon is a widely used inert material which is readily available and inexpensive. Further, it is well known in the art of electrical connecting structure to combine silicone layer

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with gold filaments (see evidential references, Cheng et al. (US 6579106) & Westwater et al. (US 5858862)) to make flexible conductive filaments.

Regarding Claim 15, Najafi et al. discloses a sensor arrangement (e.g., sensor package, Abstract) comprising:

- a semiconductor chip having a first surface (e.g., sensor chip, C6/L34, Fig. 1A (1)), which has a media-sensitive region (e.g., sensing element, C6/L35, Fig. 1A (4)) and at least one, first, electrical contact surface (Fig. 1A (10));
- a support having a second surface (e.g., substrate, C6/L27, Fig. 1A (2)), which faces said first surface of said semiconductor chip (see Fig. 1A), has an opening (e.g., access hole, C6/L36, Fig. 1A (3)), which at least overlaps with said media-sensitive region, and at least one, second, electrical contact surface (e.g., metal pad, C6/L25, Fig. 1A (7)), which at least overlaps with said at least one, first, electrical contact surface; and
- an anisotropic conductor (e.g., conductive polymers & underfill material, C6/L38 & C6/L46, respectively, Fig. 2A (5) & (14), also see Fig. 2C & C7/L3-10), which is arranged between said support and said semiconductor chip and produces an electrically conducting connection between said at least one, first, contact surface and said at least one, second, contact surface, and which has a traversing opening, which at least overlaps with the opening in said second surface, so that said media-sensitive region of said semiconductor opening is contactable through said opening (see Fig. 2A (3)) with an analyte, wherein:



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- said anisotropic conductor seals the region outside of said opening against contamination with the analyte (see Fig. 2C & C4/L49-61); and
- said anisotropic conductor is elastic (e.g., conductive polymers & underfill material, C6/L38 & C6/L46-51, respectively).

Regarding Claim 15, Najafi et al. discloses all the claim limitations as set forth above. However, Najafi et al. fails to disclose the material being a silicone layer with embedded gold filaments.

Baxter et al. discloses a silicon substrate with gold filament deposited (C2/L61-63).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to deposit gold film deposited on a silicon substrate, as taught by Baxter et al., to the sensor arrangement with conductive polymers & underfill material, as taught by Najafi et al., since gold has been known in the art to have high conductivity and are readily available. In addition, silicon is a widely used inert material which is readily available and inexpensive. Further, it is well known in the art of electrical connecting structure to combine silicone layer with gold filaments (see evidential references, Cheng et al. (US 6579106) & Westwater et al. (US 5858862)) to make flexible conductive filaments.

Regarding Claims 13, 14, 16 & 17, Najafi et al. discloses all the claim limitations as set forth above. In addition, Najafi et al. discloses the sensor arrangement wherein the semiconductor chip has a media-sensitive region (e.g., sensing element, C6/L35, Fig. 1A (4)).

However, Najafi et al. fails to disclose an ion sensitive region.

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Baxter et al. discloses a sensor arrangement (e.g., ion-sensitive field effect transistor, Abstract), comprising:

- a semiconductor chip having a first surface (e.g., silicon substrate, C7/L45, Fig. 3 (340));
- said semiconductor chip has an ion-sensitive region (e.g., ion sensitive field effect transistor, C8/L15); and
- said semiconductor chip is a pH sensor element or a redox sensor element (e.g., ion sensitive field effect transistor, C8/L15).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use an ion-sensitive region as the media sensitive material where the chip is a pH sensor element, as taught by Baxter et al. to the sensor arrangement, as taught by Najafi et al., since using a specific sensing region on a semiconductor chip is well known in the art in the medical and biomedical fields (Baxter et al., C1/L35-48). In addition, it is advantageous to use semiconductor chips since they are readily available and are widely used as sensors.

### ***Response to Arguments***

8. Applicant's arguments filed 03/09/2009 have been fully considered but they are not persuasive.

9. In response to applicant's argument that "a solder bump is neither a particle, grain or filament", it is noted that a solder bump is known in the art as a conductive material (particle) which could be used as a "filament" interconnecting semiconductors. In addition, Applicant's remark regarding the "solder bumps" is not commensurate in scope with the pending claims.

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10. In response to applicant's argument that “a sealing element, which is clamped”, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

11. In response to applicant's argument that “the arrangement disclosed in the Najafi et al reference has to be produced in several steps”, it is noted that said arguments are not given patentable weight in the product claims. In addition, determination of patentability is based on the product itself and does not depend on its method of production. *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). As the court stated in *Thorpe*, 777 F.2d at 697, 227 USPQ at 966 (The patentability of a product does not depend on its method of production. *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969).

In response to applicant's argument that “applicant cannot see why the skilled person should replace the soldering or adhesive connection between the substrate and the sensor disclosed in the Najafi et al reference by a silicone layer with embedded gold filaments”, it is noted that it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicone layer with embedded gold filaments as the conductive polymer material, since gold has been known in the art to have high conductivity. In addition, it is well known in the art of electrical connecting structure to combine silicone layer with gold filaments (see evidential references, Cheng et al. (US 6579106) & Westwater et al. (US 5858862)) to make a flexible conductive filament.

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***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Cheng et al. (US 6579106) & Westwater et al. (US 5858862) each discloses silicon embedded with gold filaments.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEAN KWAK whose telephone number is (571) 270-7072. The examiner can normally be reached on M-TH, 5 am - 3:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

11May09

/D. K./

Examiner, Art Unit 1797

/Lyle A Alexander/

Primary Examiner, Art Unit 1797